

**COMBINED EFFECT OF ARBUSCULAR MYCORRHIZAL ISOLATES
AND EPPAWELA ROCK PHOSPHATE LEVELS ON COCOA
(*Theobroma cacao* L.) SEEDLINGS**

**W.M.S.M. Wijekoon,¹ T.E. Weerawardena,² D.M. Jinadasa,¹
H.A. Sumanasena**

¹*Department of Soil and Water Resources Management, Faculty of Agriculture,
Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura, Sri Lanka.*

²*Central Research Station, Department of Export Agriculture, Matale, Sri Lanka*

³*Intercropping and Beetle Research Station, Department of Export Agriculture,
Narammala, Sri Lanka.*

Cocoa is one of the important export agricultural crops of Sri Lanka. There is a growing demand for certified organic cocoa in the world creating a higher potential to increase organic cocoa cultivations in Sri Lanka. Phosphorus (P) is one of the limiting nutrients in tropical soils and Mycorrhiza has an ability to make available P to plant uptake. On this context, this experiment was conducted at the Central Research Station, Matale to investigate the inoculative ability of different Arbuscular Mycorrhizal (AM) isolates and their effects on the growth of cocoa seedlings under different P fertility levels. Three month old standard cocoa seedlings were repotted in

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polythene bags of 25 cm x30 cm. Two AM inoculants local isolate (DEAAMS 1) and standard *Glomus mosseae* approximately 400 spores in 150 g of soil were tested with non-AM plants at three P levels (5, 50 and 100 μ g P g⁻¹) in a factorial design (3x3) with 20 replications. Eppawela rock phosphate was used as the P source. Microscopic visualization of vesicles and internal mycelia in stained roots confirmed the successful infection of cocoa plants by each AM isolate. Effect of each AM isolate was significant ($p < 0.05$) for fresh weight of shoots at 15 weeks after inoculation and had mean fresh weights 53.03 g, 50.24 g and 46.7 g per plant for DEAAMS1, *Glomus mosseae* and non-AM plants, respectively. Nevertheless, root observations under

Glomus mosseae at 5 μ g P g⁻¹ soil indicated the superiority of *Glomus mosseae* than DEAAMS 1. Rhizosphere soil pH gradually increased with increase of P level at non-AM treatments. In contrast, the increase in P retarded the presence of AM inoculation under standard AM. Overall plant and soil parameters suggest that local isolate is also effective enough and can be further upgraded.

Key words: Arbuscular mycorrhiza, Eppawela rock phosphate, *Glomus mosseae*, *Theobroma cacao* L.